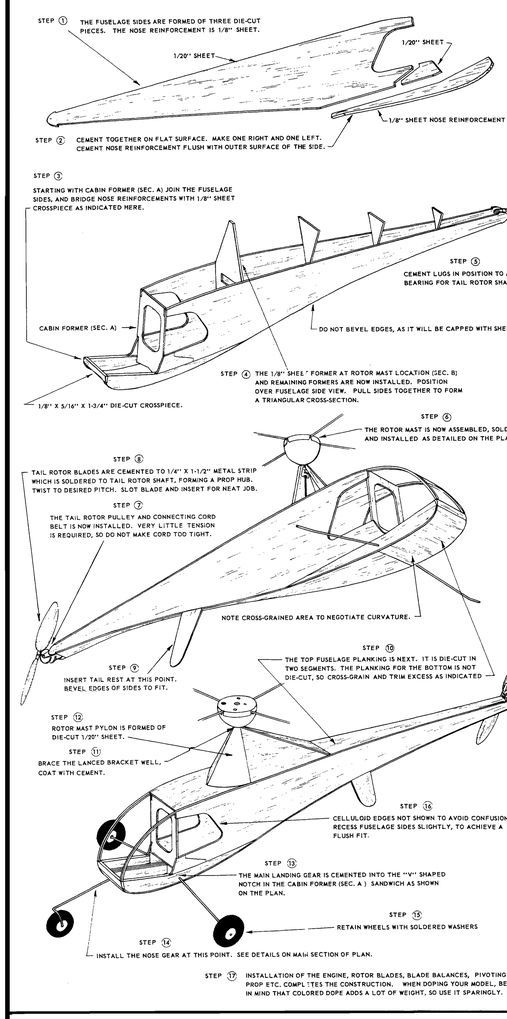
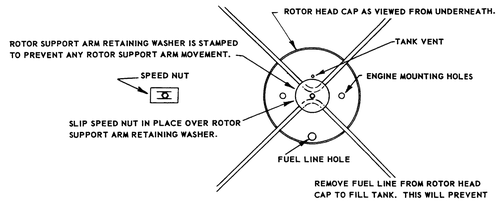
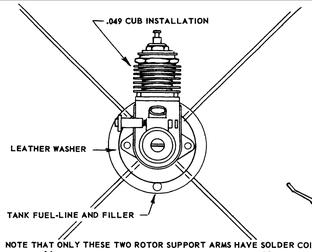
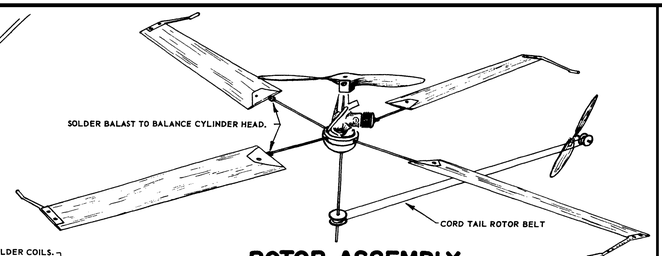
# FUSELAGE CONSTRUCTION:




# ROTOR SUPPORT ARM INSTALLATION



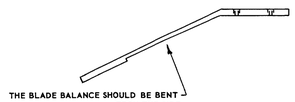



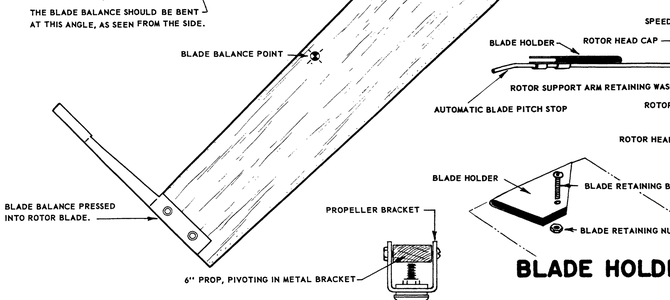




# ROTOR ASSEMBLY

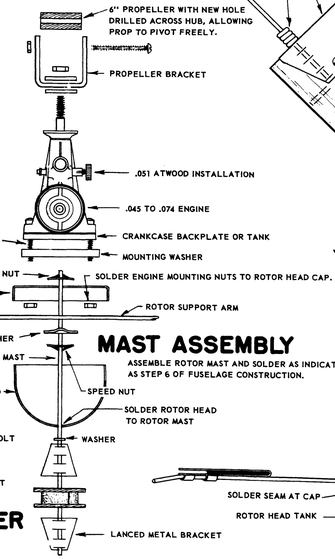
ROTOR BLADES MAY BE REPLACED ON THE FIELD. BRING ALONG A SPARE IN CASE OF DAMAGE. AS ROTATIONAL SPEED IS VERY LOW, IT IS NOT NECESSARY TO AIRFOIL OR DOPE THEM FOR EMERGENCY USE.

# BLADE BALANCE

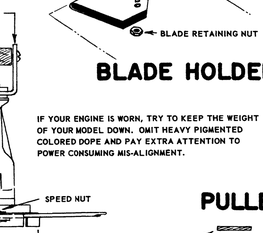




# ROTOR LAYOUT



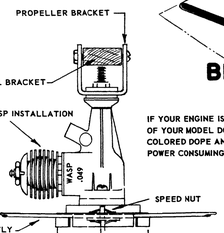

# MAST ASSEMBLY

ASSEMBLE ROTOR MAST AND SOLDER AS INDICATED AS STEP 6 OF FUSELAGE CONSTRUCTION.




# BLADE HOLDER

IF YOUR ENGINE IS WORN, TRY TO KEEP THE WEIGHT OF YOUR MODEL DOWN. OMIT HEAVY PIGMENTED COLORED DOPE AND PAY EXTRA ATTENTION TO POWER CONSUMING MIS-ALIGNMENT.

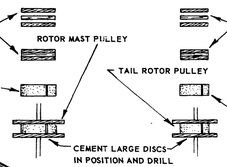


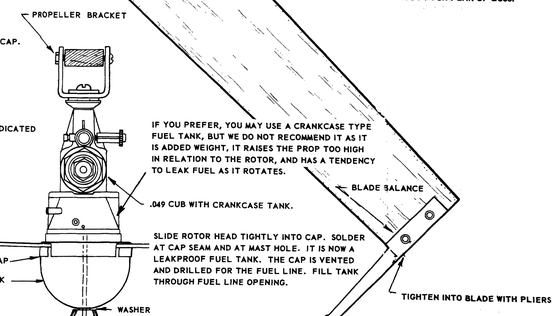

IF YOU INSTALL AN .074 ENGINE IN YOUR MODEL, HOLD BACK ON THE POWER A BIT FOR TEST FLIGHTS. ALL .045 TO .049 ENGINES SHOULD RUN AT TOP SPEED FOR TEST FLIGHTS.

MUCH LESS POWER CAN BE USED AFTER YOU HAVE TRIMMED THE MODEL FOR FLIGHT AND GAINED EXPERIENCE IN HANDLING IT. IT WILL HOVER AT ABOUT 2/3 NORMAL .049 POWER.

BEND THE ROTOR SUPPORT ARMS UPWARD SLIGHTLY TO ADD A LITTLE DIHEDRAL TO THE ROTOR BLADES.

# PULLEY CONSTRUCTION







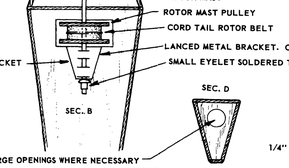
# BLADE PITCH

AUTOMATIC BLADE PITCH STOP

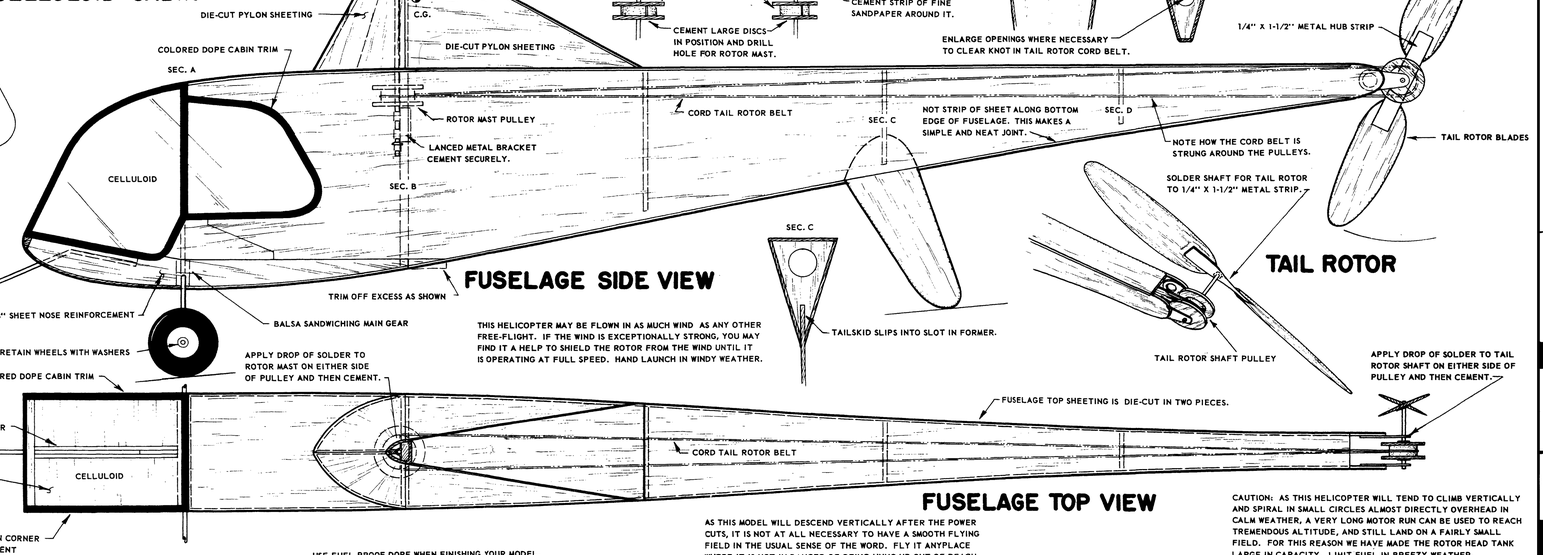
IN FLIGHT EACH ROTOR BLADE WILL SEEK ITS OWN PITCH.

THE RATE OF DESCENT ON THE FREE-WHEELING ROTOR IS COMPARABLE TO THAT OF A DETHERMALIZED FREE-FLIGHT. THE MODEL WILL LAND GENTLY, YET IT CAN BE FLOWN IN THERMAL WEATHER WITHOUT MUCH FEAR OF LOSS.

# ASSEMBLED ROTOR MAST




# CELLULOID CABIN




# FUSELAGE SIDE VIEW

THIS HELICOPTER MAY BE FLOWN IN AS MUCH WIND AS ANY OTHER FREE-FLIGHT. IF THE WIND IS EXCEPTIONALLY STRONG, YOU MAY FIND IT A HELP TO SHIELD THE ROTOR FROM THE WIND UNTIL IT IS OPERATING AT FULL SPEED. HAND LAUNCH IN WINDY WEATHER.




# TAIL ROTOR



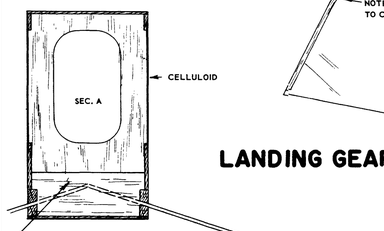

# FUSELAGE TOP VIEW

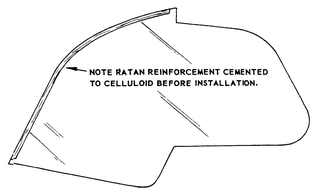
AS THIS MODEL WILL DESCEND VERTICALLY AFTER THE POWER CUTS, IT IS NOT AT ALL NECESSARY TO HAVE A SMOOTH FLYING FIELD IN THE USUAL SENSE OF THE WORD. FLY IT ANYPLACE WHERE IT IS NOT IN DANGER OF BEING HUNG UP OUT OF REACH.

USE FUEL PROOF DOPE WHEN FINISHING YOUR MODEL.

CAUTION: AS THIS HELICOPTER WILL TEND TO CLIMB VERTICALLY AND SPIRAL IN SMALL CIRCLES ALMOST DIRECTLY OVERHEAD IN CALM WEATHER, A VERY LONG MOTOR RUN CAN BE USED TO REACH TREMENDOUS ALTITUDE, AND STILL LAND ON A FAIRLY SMALL FIELD. FOR THIS REASON WE HAVE MADE THE ROTOR HEAD TANK LARGE IN CAPACITY. LIMIT FUEL IN BREEZY WEATHER.

# LANDING GEAR INSTALLATION



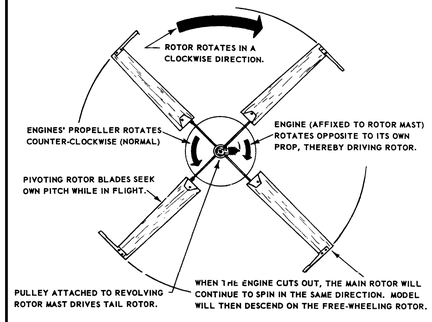





# FLYING INSTRUCTIONS:

Your CLOUD-COPTER "TR" should be thoroughly checked over before flying to make sure all moving parts are thoroughly lubricated, aligned and not binding in any way. The cord belt driving the tail rotor should not be too tight. The prop on the engine should pivot freely, as should the rotor blades. Select a calm day for test flights, as you would with a regular free-flight.

The accompanying drawing illustrates propeller and main rotor rotation. Bear in mind that the pivoting rotor blades seek their own pitch in the air, and therefore cannot function if they're the least bit stiff. Likewise, if the rotor mast does not revolve freely, the friction will cause the fuselage to rotate with it. The tail rotor is designed to compensate for a normal amount of this friction, and by adjusting the pitch, it can be trimmed to an unbelievable degree. However, if an undue amount of this friction is present, the tail rotor may not be able to counteract it.




Measure out the desired amount of fuel. Fill your tank, and start your engine in any position you find comfortable. Full power (.049) is advisable for test flights, as errors in trim are less pronounced when the model is in a climbing attitude, rather than hovering.

Hold model at shoulder height, nose into wind. Make sure revolving rotor blades are right side up. (Pivoting action of blades often causes them to flip upside down in the engine starting process. As rotor is set in motion, and rotor speed increases, they will automatically right themselves.) Do not launch until rotor is operating at top speed, at which time the model will rise from your hand in vertical or forward flight. Never push model into air. R.O.G. unassisted in calm weather only.

Proper alignment and balance is a must. Fluctuations in R.P.M. during flight will cause model to climb or hover. Air conditions and other factors will set model in forward flight etc. Switch fuels, square off prop tips and airfoil rotor blades for peak performance.

These factors alter flight trim and may be used as possible adjustments. C.G. too far forward causes dive, too far aft it causes a stall. Do not alter materially from position shown. Slow R.P.M. to hover, observe for erratic tendencies. Trim turn with pitch of tail rotor. Add slight dihedral to rotor blades if sideslip is detected. Trim blade balances and cylinder head ballast. Do not alter basic shape of fuselage. If spinning tendency to left is noted, adjust for spiral to right with tail rotor.

You will find this model as easy to adjust and fly as any regular free-flight. Due to the low forward speed, the fuselage is almost never damaged in any mishap. The rotor mechanism being metallic and flexible is never a cause for concern. What little damage there might be is usually the rotor blades, which are sheet balsa, and instantly replaceable on the field. Altitude is limited by the engine R.P.M. and fuel allotment. With the rotor head tank filled, we estimate altitudes of from 700 to 1000 feet, and that is conservative., so limit your fuel accordingly.

# BUILDING INSTRUCTIONS:

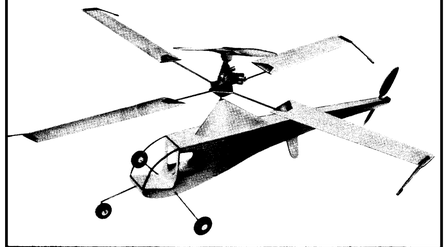
The CLOUD-COPTER "TR" was designed for Berkeley by Roy L. Clough Jr. who is considered as the authority on model helicopters. Mr. Clough has built dozens of successful helicopters of many configurations, and has evolved this design to fill the need for a high performance realistic helicopter which can climb vertically, hover, fly forward and backward, spiral etc. and still be flown safely by anyone without previous helicopter experience. In addition, we have tested this design for many months, and have further simplified and refined the rotor mast, fittings and outward appearance of the model.

Begin construction by following the Fuselage Construction details at the left. As the fuselage is of sheet construction, and basically a triangle in cross-section, it is the utmost in simplicity. Once the formers are installed, assemble the rotor mast and adapt if necessary to your engine. Solder up, and install complete with pulley on 1/8" sheet former. The tail rotor pulley (smallest of the two) and connecting string belt is installed at this point, after which the die-cut top sheeting is cemented in place.

As for the landing gear, refer to the extreme lower left section of this plan. The cabin former is die-cut to receive the main gear wire, which is then reinforced on either side by the die-cut pieces visible in Sec. A. The nose gear is retained in a similar fashion, and is also detailed at the lower left. Retain wheels with soldered washers.

Cement the ratan corner reinforcements to the side-cabin celluloid before it is attached to the model. For a really neat job, recess the fuselage side slightly to receive celluloid. Trim with colored dope as indicated.

The pylon around the rotor mast is now sheeted, rotor blades are installed etc. A hole should be drilled through the engine's prop hub as detailed in the mast assembly. All moving parts must be free-working, well lubricated. This is imperative.



## "1/2A" FREE-FLIGHT HELICOPTER

## CLOUD-COPTER "TR"

**with Adjustable Pitch Tail Rotor**

**For .045 to .074 Engines - 25" Rotor Span**

DESIGNED BY: ROY L. CLOUGH JR.
DRAWN BY: DON McGOVERN
KIT ENGINEERED BY: BILL EFFINGER



**BERKELEY MODELS INC.,**
WEST HEMPSTEAD, NEW YORK, U.S.A.